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ABSTRACT

This is an evaluation report of a New York City school district educational project funded under Title I of the Elementary and Secondary Education Act of 1965. The program was designed to provide bilingual instruction to pregnant school-age girls who were two or more years below grade level in reading and mathematics. It was also designed for students who were deficient in their ability to speak and understand English. Approximately 40 Spanish-speaking students, aged 13 to 19, were enrolled in the program; however, due to poor attendance and a high rate of attrition, there were only 20 students on register at any particular time. A bilingual teacher, and an educational assistant conducted the program of individualized instruction under the supervision of the school principal. Achievement data are presented for reading and mathematics. A historical regression analysis was used to compare actual posttest scores with anticipated posttest scores. Although this method of data analysis did not reveal statistically significant gains in reading and mathematics, it did show that students gained over one month in both reading and mathematics for each month of the treatment period. Students made statistically significant gains in Spanish vocabulary and comprehension. The program objectives were met for those students who participated in the program. (Author/BS)

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EVALUATION REPORT

Function No. 09-58602

BILINGUAL INSTRUCTION IN READING AND MATHEMATICS OF PREGNANT NON-ENGLISH SPEAKING STUDENTS

EVALUATION PERIOD

February-
June, 1975

Merrill T. Hollinshead, Ph. D.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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An evaluation of a New York City School district educational project funded under Title I of the Elementary and Secondary Education Act of 1965 (PL 89-10) performed for the Board of Education of the City of New York for the 1974-75 school year.

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CHAPTER I

THE PROGRAM

A program of bilingual instruction in reading and mathematics of pregnant non-English Speaking students was conducted between February 3, 1975 and the end of the current school year at the Center of Continued Education (PS 911 M), 22 East 128th Street, New York City. This program was designed to provide bilingual instruction in reading and mathematics to pregnant school-age girls to whom English was a second language and who were two or more years retarded in the two subject areas. The students ranged in age from 13 to 19 years, and resided in economically deprived areas, principally in East Harlem. Spanish was the principal language spoken in the students' homes.

During the course of a school year, approximately 40 students were enrolled in this special program, with a maximum of 20 on register at any particular time. The pupil population was highly transient. Students had frequent clinic appointments, were absent because of illness associated with their pregnancies, left school to have their babies, and returned after two or three weeks to resume their studies. Attendance, because of these factors, was approximately 40%.

The major thrust of this program consisted of bilingual instruction in reading, language arts, and mathematics. Under the supervision of the school principal, a bilingual teacher fluent in both Spanish and English, and a bilingual educational assistant worked with the students individually or in small

groups, in order to improve their reading and mathematics levels.

During a six-period day, students attended a varied program of activities which included bilingual and English instruction in regular high school subjects as well as sequences in Spanish Culture and English as a Second Language. Each child was programmed individually, since there was wide variations within the group in comprehension of English, even though the speaking English of most of the students was inadequate. In every subject area, however, the emphasis was on the building of vocabulary and comprehension skills, and speaking and reading knowledge of the two languages. The total program of each student was based upon an analysis of his individual needs, and was changed as the student matured academically.

Students were placed in this special program if their ability to speak and comprehend English and their reading and mathematics levels were two or more years below grade. The selection procedure also included the administration of the Language Ability Scale and interviews with the school guidance counselor and the Title I bilingual teacher.

The bilingual teacher coordinated each student's program as she attended regular high school courses in the building, conferring with teachers where problems arose, and discussing each student's progress with teachers and the guidance counselor of the school. Thus he was able to give support to the student during the periods in which she was not under his direct supervision.

CHAPTER II

EVALUATIVE PROCEDURES

The evaluation objectives for this program were as follows:

1. As a result of participation in the program of bilingual instruction in reading, students will show a statistically significant difference between real post-test scores and anticipated post-test scores, based upon the results from the administration of the Metropolitan Reading Achievement Test. (Historical Regression Design)

2. As a result of participation in the program of bilingual instruction in mathematics, students will show a statistically significant difference between real post-test scores and the anticipated post-test scores, based upon the results from the administration of the Metropolitan Arithmetic Achievement Test. (Historical Regression Design)

3. As a result of participation in the program of bilingual instruction, students will show a statistically significant difference between pre-test and post-test scores, based upon the results of the administration of the Cooperative Inter-American Test, given in Spanish. (correlated *t* design)

The Metropolitan Achievement Tests were administered by an English teacher at PS 911M. The Cooperative Inter-American Test administration was carried out by the Title I bilingual teacher. The Intermediate Level forms of the Metropolitan Achievement Test were used for both reading and arithmetic. Since no grade norms were available for the Cooperative Inter-American Test (Spanish), the average of the raw scores obtained on the vocabulary, reading comprehension, and language sections of the test were used in data analysis.

All pre-test procedures were conducted during December, 1974 and January, 1975. The post-tests were administered during the last week in May and the first week in June.

The evaluation objectives were met, excepting for data loss. Several conditions were present which made it impossible for all participants who were on register during the treatment period to be included in the data analysis. Ten girls withdrew from school during the treatment period (3 to 4 months) to give birth of their babies. One girl transferred to another school during this period. The population of the school was very transient, with students required to attend clinics, or needing to stay home until arrangements were completed for the care of their infants. Irregular attendance made it difficult for tests to be administered during both the pre- and post-test period.

A further limitation on the evaluation procedure was imposed by late funding of the project. The official starting date was February 3, and the pre-testing took place in February and March. This restricted the treatment period to 3 or 4 months, depending on when each student received her first test. The evaluator-consultant asked for post-test data to be available on June 9, in order that he would have sufficient time for data analysis and report writing. This imposed some hardship on the teachers who were responsible for administering the terminal tests.

The evaluation objectives were carried out as projected, excepting that considerable data loss occurred, primarily because students withdrew from school in order to give birth to their babies. Some of these students returned to school after their babies were born; others remained at home. The

figures on data loss are furnished on the Data Loss Form, attached to the MIR items #30.

CHAPTER III

FINDINGS

The first evaluation objective predicted that participants in the bilingual program would show improvement in reading, following the treatment period, such improvement being demonstrated by a statistically significant difference between the real post-test scores and the anticipated post-test scores (Historical Regression Design). A statistically significant difference was not obtained. (See Table 1)

The second evaluation objective stated that participants in the bilingual instruction program in mathematics would show improvement in this subject-matter area, such improvement being demonstrated by a statistically significant difference between the real post-test scores and the anticipated post-test scores (Historical Regression Design). Again, a statistically significant difference was not obtained. (See Table 2)

The third evaluation objective stated that participants in the programs of bilingual instruction would show a statistically significant difference in Spanish vocabulary and comprehension between the pre-test and post-test scores on the Cooperative Inter-American Test (correlated "t" design). A statistically significant difference was obtained ($p \leq .01$). (See Table 3)

It should be noted that although statistically significant differences were not obtained between the real post-test scores and the anticipated post-test scores in reading and arithmetic, meaningful gains of approximately one-half year were obtained

Table 1

Results: Metropolitan Achievement Test - Reading

Component Code	Activity Code	Total Participants	Group ID	Number Tested	Pretest Mean	Predicted Posttest Mean	Posttest Mean	Obtained Value of t	Significance Level
66715,16	720	21	15,16	11	6.6	6.85	7.40	1.29	not significant

Table 2

Results: Metropolitan Achievement Test - Arithmetic

Component Code	Activity Code	Total Participants	Group ID	Number Tested	Pretest Mean	Predicted Posttest Mean	Real Posttest Mean	Obtained Value of t	Significance Level
66815,16	720	21	15,16	10	6.3	6.52	7.04	1.51	not significant

Table 3

Results: Cooperative Inter-American Test

Component Code	Activity Code	Total Participants	Group ID	Number Tested	Pretest Mean	Posttest Mean	Posttest Mean	Obtained Value of t	Significance Level
66715,16	720	21	15,16	13	22.69	28.30	t	8.97	$p \leq .01$

when one compares the real and anticipated post-test scores, in both subject-matter areas. Thus the students gained more than one month in reading and arithmetic for each month of treatment. The small number of students whose scores were analyzed affected the power of the statistical test used, thus creating a situation where meaningful differences could be declared statistically significant.

The bilingual teacher and his educational assistant were furnished with an abundance of materials for use in the program, supplemented by teacher-made instructional devices. The special-class room was well located and beautifully maintained and it was easily adaptable for the frequent use of audio-visual aids.

The program was carried out with faithful adherence to the plans which were set forth in the project proposal. It served the population of bilingual pregnant girls who were found to be two or more years retarded in reading and arithmetic, the specific population for which the program was designed.

Although this program does not represent a recycling of a prior project under Title I, a similar program, funded under Urban Education, was carried out in the school during the 1973-74 school year. Seven of the nine recommendations made by the evaluator-consultant of this prior program have been carried out during the 1974-75 program: a. the bilingual teacher should teach Spanish to girls other than those who are bilingual; b. the teacher's role should be expanded to allow for the development of materials; c. the curriculum

should be augmented by the development of courses in business and professional Spanish; d. the educational aide should make home visits, accompanying the school social worker in this activity; e. an understanding masculine figure should be retained as the one who, under the principal of the school, coordinates the program; f. pre- and post-tests in Spanish should be incorporated into the program; and g. greater effort should be made to encourage better attendance of the students. All of these recommendations were accepted and acted upon positively.

Two other recommendations were not carried out, although every attempt was made by the school principal to follow through on these recommendations. It was suggested that a Spanish-speaking physician (female) be assigned to the school for one half or one full day a week. A request for such an assignment was not acted upon. Again, a further recommendation was made that a nursery be established in the school so that students could return to school after their babies were born; it was not possible to fund such an arrangement.

CHAPTER IV

SUMMARY OF MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

A program of bilingual instruction (English-Spanish) in reading and mathematics of pregnant non-English speaking students was conducted at the Center of Continued Education (PS 911M) between February 3rd and the end of the school year. The program emphases were on bilingual instruction in reading, language arts, and arithmetic. A bilingual teacher, fluent in English and Spanish, and an educational assistant conducted the program under the supervision of the principal of the school.

The evaluation objectives were concerned with measuring the improvement in reading as measured by the Metropolitan Reading Test, and gains in arithmetic skills, as measured by the Metropolitan Arithmetic Test. A historical regression design was used to compare real post-test scores with anticipated post-test scores. No statistically significant differences were found between the scores used in the comparisons. However, in both reading and arithmetic, students gained over one month for each month of the treatment period.

An additional evaluation objective was stated in terms that students participating in this bilingual instruction program would show statistically significant gains in Spanish vocabu-

lary and comprehension when a comparison was made between pre-test and post-test scores on the Cooperative Inter-American Test. The results showed a statistically significant difference at the .01 level (Correlated t Design).

There were no discrepancies between the program as set forth in the project proposal and the actual operation of the program. It served the appropriate target population, and was carried out effectively by the teaching staff.

Recommendations for further implementation of the program are as follows:

1. The program should be recycled during the next academic year. It serves a specific need which ordinarily cannot be met by a regular high school program, and the findings of this evaluation study indicate that meaningful academic gains have resulted from the participation of students in the program.

2. An attendance teacher, with social-work background should be assigned on a part-time basis to this program. The services of such a professional worker should be able to facilitate the improvement in the attendance of the students.

3. The program should be funded for an academic year. This would tend to reduce the data loss which was significant during the three to four month treatment period. More students would be able to return to school after their babies were born, increasing the number who would be on register at the post-testing period.

4. In addition to the standardized tests of achievement, or perhaps instead of these tests, consideration should be given to the use of criterion-reference testing.

CHAPTER V

EXEMPLARY PROGRAM ABSTRACT

Component Code	Activity Code	Objective Code
6 6 7 11 5,6	7 2 0	8 0 1
6 6 8 11 5,6	7 2 0	8 0 1

Gains in reading and arithmetic in excess of one month's gain for each month of treatment were referred to in the FINDINGS chapter. Over a treatment period of from 3 to 4 months, subjects whose test scores were analyzed showed a 5.5 months gain in reading and 5.2 months gain in arithmetic (Metropolitan Achievement Tests). These gains are particularly meanful in view of the poor attendance records of the students. It would appear that the bilingual instruction, given individually and to small groups of students was an important factor in the improvement in the two subject-matter areas. The students learned to move freely back and forth from Spanish to English, and were able to demonstrate improvement in reading and arithmetic on tests written in English, even though their first language was Spanish.

Use Table 30A. for Historical Regression Design (6-Step Formula) for Reading (English); Math (English); Reading (Non-English); Math (Non-English).

30A. Standardized Test Results.

In the Table below, enter the requested information about the tests used to evaluate the effectiveness of major project components/activities in achieving desired objectives. This form requires means obtained from scores in the form of grade equivalent units as processed by the 6 step formula (see District Evaluator's Handbook of Selected Evaluation Procedures, p. 45-49). Before completing this table, read all footnotes. Attach additional sheets if necessary.

[49]

Component Code	Activity Code	Test Used[1]	Form		Level		Total N[2]	Group I.D.[3]	Number Tested[4]	Pretest		Predicted Posttest Mean	Actual Posttest		Statistical Data	
			Pre	Post	Pre	Post				Date	Mean		Date	Mean	Obtained Value of t	Level[5] of significance
66711,16	720	MAT * Rdg.	F	H	Inter-mediate		21	15, 16	11	2,3-1975	6.63	6.85	5,6-1975	7.40	1.29	not sig.
66811,16	720	MAT ** Arith.	F	H	Inter-mediate		21	15, 16	10	2,3-1975	6.30	6.52	5,6-1975	7.04	1.51	not sig.

1/ Identify the test used and year of publication (MAT-58, CAT-70, etc.).
2/ Total number of participants in the activity.
3/ Identify the participants by specific grade level (e.g., grade 3, grade 5). Where several grades are combined, enter the last two digits of the component code.
4/ Total number of participants included in the pre and posttest calculations.
5/ Specify level of statistical significance obtained (e.g., $p \leq .05$; $p \leq .01$).

* Metropolitan Reading, 1971 Edition
** Metropolitan Arithmetic, 1971 Edition

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Use Table 30C. for norm referenced achievement data not applicable to tables 30A. and 30B.

30C. Standardized Test Results

In the table below, enter the requested information about the tests used to evaluate the effectiveness of major project components/activities in achieving desired objectives. Before completing this form, read all footnotes. Attach additional sheets if necessary.

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Component Code	Activity Code	Test Used[1]	Form		Level		Total N[2]	Group ID[3]	Number Tested		Pretest			Posttest			Statistical Data		
			Pre	Post	Pre	Post			N[4]	Score Type[5]	Date	Mean	SD[6]	Date	Mean	SD[6]	Test[7]	Value[8]	Level[9]
66711,16	720	Coop. InterAm*	(L3	DES)	3	3	21	15, 16	13	6	2,3-1975	22,6	4,64	5,6-1975	28.3	4,67	t	8,97	p≤.01

1/ Identify Test Used and Year of Publication (MAT-58; CAT-70, etc.)
2/ Total number of participants in the activity
3/ Identify the participants by specific grade level (e.g., grade 3, grade 5). Where several grades are combined, enter the last two digits of the component code.
4/ Total number of participants included in the pre and post test calculations.
5/ 1 = grade equivalent; 2 = percentile rank; 3 = Z Score; 4 = Standard score (publisher's); 5 = stanine; 6 = raw score; 7 = other.
6/ S.D. = Standard Deviation
7/ Test statistic (e.g., t; F; X^2).
8/ Obtained value
9/ Specify level of statistical significance obtained (e.g., $p \leq .05$; $p \leq .01$).

* Cooperative Inter-American Test

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OFFICE OF EDUCATIONAL EVALUATION - DATA LOSS FORM

(attach to MIR, item #30) Function # 09-58602

In this table enter all Data Loss information. Between MIR, item #30 and this form, all participants in each activity must be accounted for. The component and activity codes used in completion of item #30 should be used here so that the two tables match. See definitions below table for further instructions.

Component Code	Activity Code	(1) Group I.D.	(2) Test Used	(3) Total N	(4) Number Tested/ Analyzed	(5) Participants Not Tested/ Analyzed		(6) Reasons why students were not tested, or if tested, were not analyzed	
						N	%		Number/ Reason
66711,16	720	15, 16	MAT RDG*	21	11	10	48	withdrew from school (prior to retest period) because of impending birth of children	10
66811,16	720	15, 16	MAT Math**	21	10	11	55	withdrew from school (prior to retest) because of impending birth of children	10
								Transferred to another school	1
66711,16	720	15, 16	Coop. Inter-Amer***	21	13	8	38	withdrew from school before final test could be given - (impending birth of child)	8

(1) Identify the participants by specific grade level (e.g., grade 3, grade 9). Where several grades are combined, enter the last two digits of the component code.
(2) Identify the test used and year of publication (MAT-70, SDAT-74, etc.).
(3) Number of participants in the activity.
(4) Number of participants included in the pre and posttest calculations found on item #30.
(5) Number and percent of participants not tested and/or not analyzed on item #30.
(6) Specify all reasons why students were not tested and/or analyzed. For each reason specified, provide a separate number count. If any further documentation is available, please attach to this form. If further space is needed to specify and explain data loss, attach additional pages to this form.

* Metropolitan Reading
** Metropolitan Arithmetic
*** Cooperative Inter-American Test (Spanish)

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